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A METHYL BROMIDE DISPENSER FOR USE IN THE FUMIGATION OF QUARANTINED PRODUCTS

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As a means of facilitating the fumigation of quarantined plant products with methyl bromide as a basis for certification, a dispenser that accurately measures small quantities of gas used in fumigation chambers has been developed.

Methyl bromide is a gas at ordinary temperatures, its boiling point being 40.1° F. As a liquid it has a specific gravity of 1.732 and as a gas it is approximately 3.5 times as heavy as air.

The dispenser described herein consists essentially of two $\frac{1}{8}$" angle valves, one $\frac{1}{8}$" brass vent cock, one $\frac{1}{8}$" pipe cross, three $\frac{1}{8}$" close nipples, a $\frac{1}{8}$" to $\frac{1}{4}$" close pipe coupling, a $1\frac{1}{2}$" steel grease cup with the cap bored out to $1\frac{1}{8}$" to accommodate the glass measuring tube, three $\frac{1}{8}$" pipe to $\frac{1}{4}$" copper tubing fittings, a 75-ml. gauge glass tube with a low coefficient of expansion and a rolled rim, a $\frac{1}{8}$" copper syphon tube, and polyvinyl alcohol gaskets, as indicated in figure 1.

Methyl bromide is supplied in steel cylinders of various capacities and under pressure, to keep it in a liquid form. In this form it can readily be measured in a graduated glass tube. However, immediately upon releasing the pressure the liquid will volatilize and can no longer be measured by this means at temperatures above 40° F. To overcome this factor, the dispenser was designed to admit liquid under pressure from the supply cylinder. Venting the excess air and gas in the dispenser lowers the temperature sufficiently, by the passage of methyl bromide from a high to a low pressure, to fill the glass with the liquid. Very little gas is wasted in this procedure, and, if a refilling of the dispenser is necessary, the dispenser need not be vented the second time.

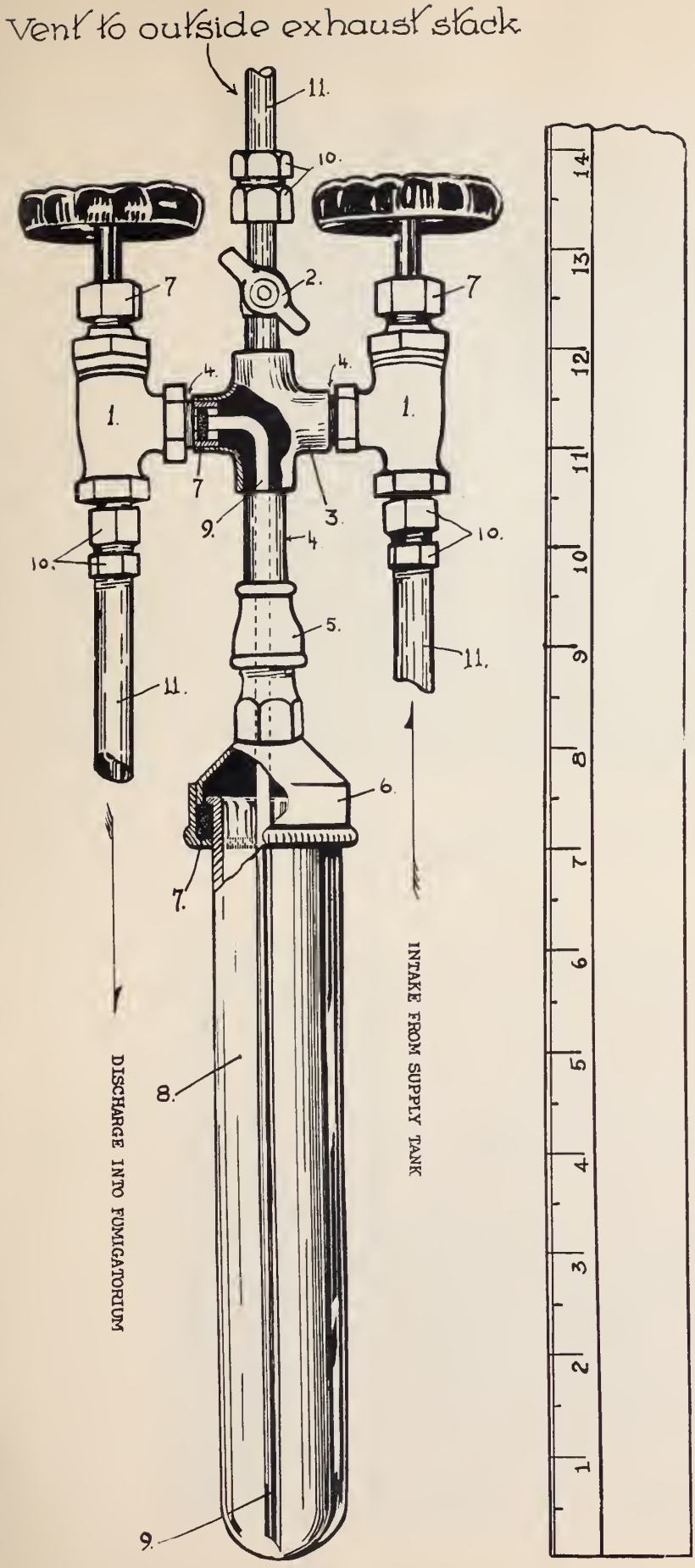
After the glass tube is filled, the supply valve on the dispenser (fig. 1) is closed, as well as the vent valve. The discharge valve on the dispenser remains closed during the filling of the dispenser. As the temperature begins to rise the gas in

the head of the dispenser expands and exerts a downward pressure on the column of liquid in the glass tube. To discharge the gas in the dispenser it is only necessary to open the discharge valve, and the gas pressure will force the liquid up through the syphon tube and out through the discharge valve into the fumigation chamber.

Construction of the apparatus is accomplished through the assembly of ordinary pipe fittings. The copper tubing and fittings may be purchased at an automobile accessory store. The glass tubing is a stock item wherever scientific glassware is manufactured. At a small additional cost it is possible to have the gauge glass tube graduated in cubic centimeters, allowing for the displacement of the syphon tube. Polyvinyl alcohol is used for gasket material at the points indicated by No. 7 in figure 1. It is not absolutely necessary to use it in the packing glands of the two angle valves, but it makes a safer job. A $1\frac{1}{2}$" I.D. steel grease cup is used for a packing gland to seal the glass measuring tube. The gasket and the grease cup cap are then slipped over the glass tube and screwed on the valve assembly, hand tight. Polyvinyl alcohol gaskets can be made with a leather belt punch out of sheet stock $\frac{1}{8}$" thick.

The total cost of the apparatus, excluding labor, is approximately $4.50.

The assembled dispenser and supply cylinder are shown in figures 2 and 3.



METHYL BROMIDE DISPENSER

1 - 1/8" Globe Valves

2 - 1/8" Vent Cock, brass

3 - 1/8" pipe cross

4 - 1/8" close nipples

5 - 1/4" to 1/8" coupling

6 - 1½" steel grease cup #1

7 - Polyvinyl alcohol gasket

8 - 1-1/8" OD gauge glass, rolled edge, round bottom, choice of graduation 0 to 75 c. c.

9 - Syphon tube of 1/8" copper tubing

10 - Copper tubing coupling 1/8" pipe, 1/4" tubing

11 - Copper tubing 1/4"

Figure 1.—Details of the dispenser.

Figure 2.--Close-up view of the dispenser and supply cylinder.

Figure 3.--Dispenser and cylinder in position on the top of a fumigating box.

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